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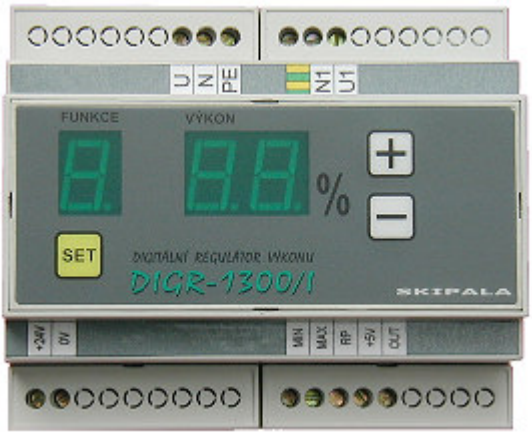
USER MANUAL FOR DIGITAL REGULATOR

DIGR-1300/I



Version: 2.7.1
November 2007

1. Technical properties

Supply voltage	18–24V DC
Switching voltage	max 230V/50Hz
Maximal output current	3A
Coverage	IP20
Working temperature	10–55°C (50–130°F)
Power dissipation	7W
Suppression of interference	EN 55011/B
Short circuit proof	1.5kA
Dimensions	106x90x58 (WxHxD)
Weight	0.4kg

2. Generally

Regulator DIGR-1300/I is intended to power regulation of vibration feeders driven by electromagnetic coil. Regulator's main component is triac, which is switched with phase shift. Regulator enables step setting of frequency: 100Hz, 50Hz, 33Hz, 25Hz, and 20Hz. The intensity of oscillations can be set from range 20–99%. Function of regulator is programmed from control panel by user. Regulator can be controlled from control panel or by external analog or digital signals. If you need to switch bigger power than the regulator enables, you can connect an extern power module to it. The control and power part are safely separate.

Small dimensions and effective user functions create preconditions for using these regulators (working alone or with superior system PLC) in most applications of vibration feeders.

3. Before connection

Check up the regulator. Be sure it hasn't been damaged by transport. In the case of damage contact the supplier.

If you see dewiness, wait for it's evaporating.

4. Installation

Mount the regulator to a terminal strip DIN TS35 in horizontal position. It is important to keep free space (20mm from upper and lower border) because of cooling.

5. Connection

Only persons with adequate electrotechnical qualification are allowed to connect the regulator.

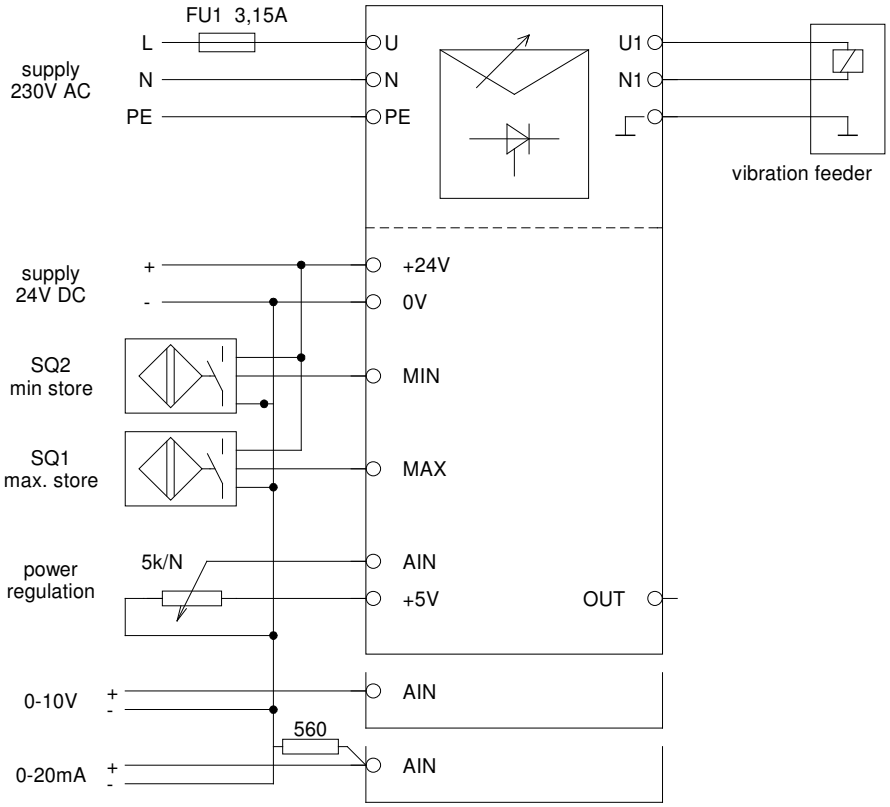
Warning! Connect only when disconnected from power network.

Make connection according to pic.1 or pic.2 or pic.3. It is necessary to make overload and short circuit protection. Choose current value and characteristics of protection element according to the inputting power of used vibration feeder. When using extern power module, it must contain accordant EMI filter.

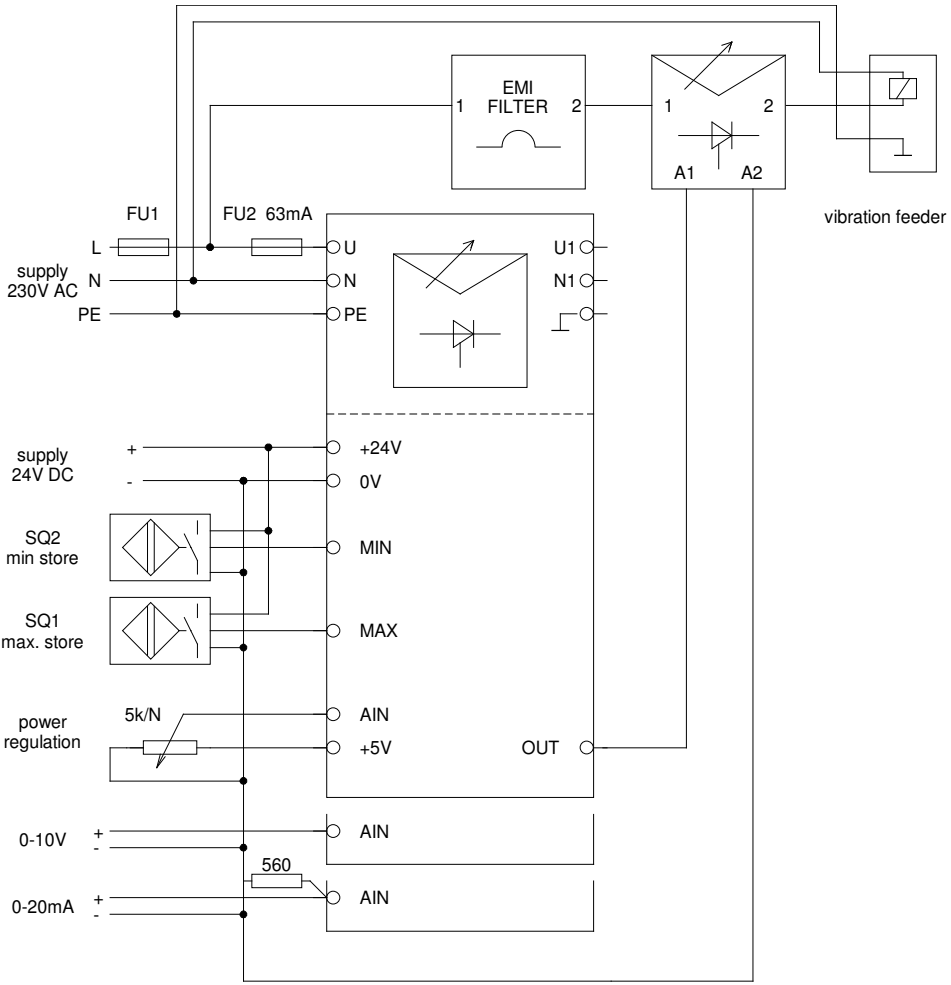
Connect clamps +**24V** and **0V** with 24V for supplying the control part. If you use sensors, they are supplied from this source. If you supply them from other source, it’s necessary to connect potentials 0V.

Connect sensors and digital or analog signals according to demands of current application (pic.1). For advanced explanation see chapter 8 – Functions description. Sensors are powered by safely separate voltage 24V DC, current drain of both sensors must not exceed 50mA. Prefer sensors of PNP type (output signal is attached to +24V). If you use sensors NPN, it’s necessary to put a 3.3kΩ resistor between supply clamp +24V and signal.

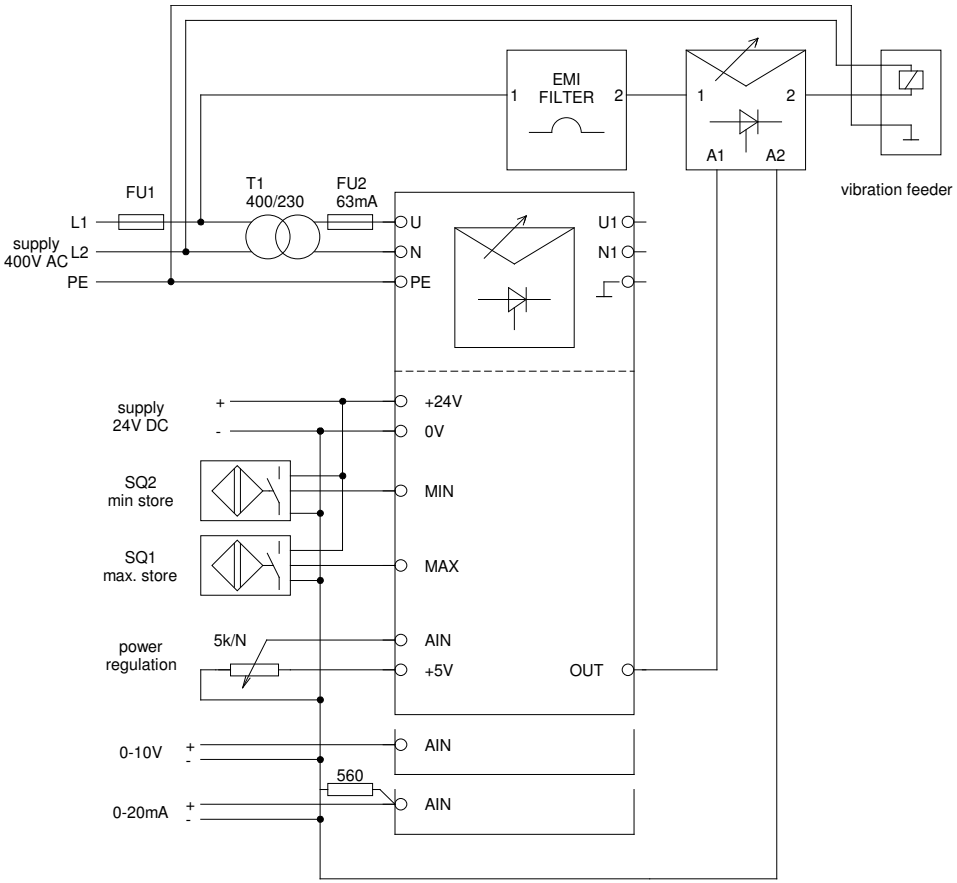
pic.1 - outer connection of regulator



pic.2 - connection of extern power module switching voltage 230V



pic.3 – *connection of extern power module switching voltage 400V*



6. Switching-on

Regulator will automatically switch on after connection of supply voltage 24V and at the same time or before connection of power voltage 230V. However this setting is not suitable as START - STOP of regulator because there is a min. 3s time-out between switching-off and switching-on. If this time-out is not kept the regulator may get blocked. In that case you must do restart (see chapter 9).

Do START-STOP by signal +24V connected to clamp MAX (see chapter no.8 Functions description - no.1).

7. Setting

Switch on the regulator and press button SET . The number of function no.0 and its value will be shown on the display. Set value of the function by buttons ⊕ ⊖. Press the button SET again. The number of function will increase by 1. After setting all values press button SET that will save all set values into memory.

If you are not in setting mode you can set only value of function no.0. - required power. Regulator can't save the change of value when running. Save will be done after changing state to STOP. **Warning!** If the regulator is RUN mode and you switch it off by disconnecting it from power network, the value of function no.0 won't be saved into memory.

The meaning of functions and their values is described in chapter 8 and in table pic.4.

8. Functions description

Function no.0 - required power

The regulator regulates power in maximal range 20-99% with step 0.5%. Value 0.5% is expressed by turning on the decimal point. The range of required power is limited by values of function no.6 - minimal power and no.7 - maximal power.

Function no.1 - sensors

Regulator can work according to the needs of concrete application without sensors, with one sensor or with two sensors. Signals from sensors set the regulator to STOP or RUN mode. Status STOP is signalised by

turning on the decimal point at number showing the number of function. The influence of sensors depends on value of function no.1:

00- Sensors are not connected. The feeder is constantly in RUN mode after switching-on.

01- One sensor is connected: SQ1 - maximal store. If the sensor is active (there's +24V on clamp MAX) the feeder is in STOP mode. In other case the feeder is in RUN mode. The change from STOP to RUN mode and otherwise is done with a time-out set by value of function no.2 and no.3 (see down).

02- Two sensors are connected: SQ1 and SQ2. If sensor SQ2 is not active (there's 0V on clamp MIN) regulator is in RUN mode. If both sensor SQ1 and SQ2 are active (there's +24V on clamps MIN and MAX) regulator is in STOP mode. The change from STOP to RUN mode and otherwise is done with a time-out set by value of function no.2 and no.3 (see down).

03- One sensor is connected: SQ1 - maximal store. Its behaviour is inverse to value 01. If the sensor is not active (there's 0V on clamp MAX) the feeder is in STOP mode. In other case the feeder is in RUN mode. The change from STOP to RUN mode and otherwise is done with a time-out set by value of function no.2 and no.3 (see down). If you start the regulator by superior controlling system PLC, use this setting. Connect the START signal with clamp MAX.

04- Two sensors are connected: SQ1 and SQ2. Their behaviour is inverse to value 02. If sensor SQ2 is active (there's +24V on clamp MIN) regulator is in RUN mode. If both sensors (SQ1 and SQ2) are not active (there's 0V on clamps MIN and MAX) regulator is in STOP mode. The change from STOP to RUN mode and otherwise is done with a time-out set by value of function no.2 and no.3 (see down).

Function no.2 – time-out when changing to RUN mode

Regulator is in STOP or RUN mode according to the information from sensors. The change from STOP to RUN mode is done with a time-out. This time-out is expressed by value 0 – 99 which means 0 – 9.9s.

Function no.3 – time-out when changing to STOP mode

Regulator is in STOP or RUN mode according to the information from sensors. The change from RUN to STOP mode is done with a time-out. This time-out is expressed by value 0 – 99 which means 0 – 9.9s.

Function no.4 – regulation method

The value of function no.4 determines the way how the required power is set:

00– Power is set by buttons ⊕ ⊖.

01– Power is set by voltage signal 0–5V on clamp no.11. This setting is suitable for using the potentiometer. Value of the potentiometer must be from range 1–10kΩ.

02– Power is set by voltage signal 0–10V or by current signal 0–20mA on clamp no.11. If you use current signal it's necessary to put a 560Ω resistor between clamp no.11 and clamp no.12.

Function no.5 – automatic switching-on

00– Automatic switching-on is blocked

01– The regulator will be automatically switched on after connection of supply voltage.

Function no.6 – minimal power

Low limit of regulation is set by value of this function. Minimal value is 20, maximal value is 10 units lower than the value of maximal power (function no.7).

Function no.7 – maximal power

High limit of regulation is set by value of this function. Minimal value is 10 units higher than the value of minimal power (function no.6), maximal value is 99.

Function no.8 – oscillations frequency

The range for frequency of oscillations is 20–100Hz. The gist of frequency change consists in skipping a certain count of sinusoid half-waves of regulated voltage. Its result is a discontinuous “jump” change. The range of this function is 0 – 4 that means frequency 100–20Hz (see table pic.5).

Function no.9 – run-up, run-out

In some cases it is desirable to run-up and run-out the feeder continuously. You can set the speed of run-up and run-out ramp by setting this value from range 0–5. Value 5 means time 5s for run-up from 0% to 100%.

9. Maintenance

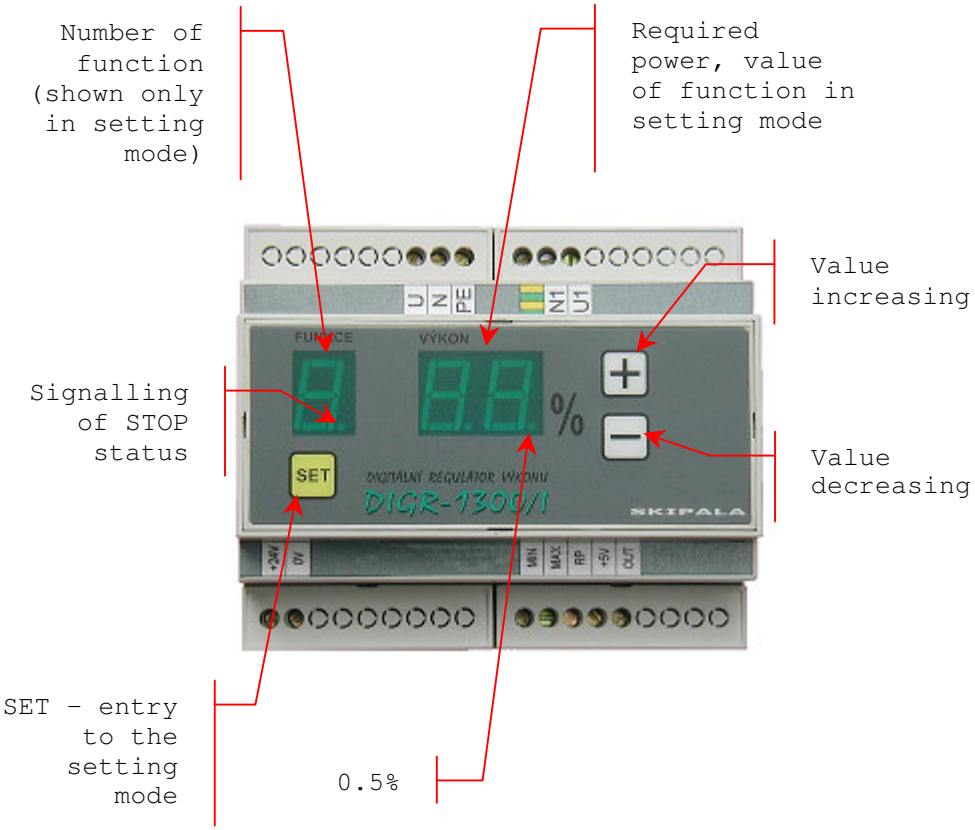
Regulator doesn’t require any special maintenance. In case of failure do not do any repairs and send the regulator to the manufacturer. A permissible faint power oscillation can occur when the regulator works. This is caused by interference from supply network.

If the regulator doesn’t work properly you can do the restart that sets all functions to default. To restart the regulator disconnect it from power 24V, press the button SET, connect the regulator to the power 24V and finally release the SET button.

pic.4 - Functions table

function no.	**value**	**description**
0 power	20-99	required power (20-99%)
1 sensors	00 01 02 03 04	no sensors one sensor, log.1 switches off two sensors, log.1 switches off one sensor, log.0 switches off two sensors, log.0 switches off
2 RUN time-out	00-99	time-out when switching from status STOP to RUN (0 - 9.9s)
3 STOP time-out	00-99	time-out when switching from status RUN to STOP (0 - 9.9s)
4 control	00 01 02	power is set by control panel power is set by potentiometer RP1 power is set by signal 0-10V or 0-20mA
5 switching-on	00 01	automatic switching-on blocked automatic switching-on allowed
6 min. power	20-89	minimal power limitation (20-89%)
7 max. power	30-99	maximal power limitation (30-99%)
8 oscillations frequency	00 01 02 03 04	100 Hz 50 Hz 33 Hz 25 Hz 20 Hz
9 run-up	0-5	time of run-up and run-out ramp (0-5s from 0% to 100%)

pic.5 - control panel description



10. Manufacturer's declaration

Manufacturer declares that the product corresponds to all requirements consequent on decree of the government no. 17/2003 Sb. and no. 18/2003 Sb. about technical requirements on products in full wording. Ground for this declaration is certificate of Electrotechnical testing institute no.1060967.

This product is safe under condition of usual using and conditions noticed in this manual.

CERTIFICATE
No.1060967

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11. Warranty

We provide you a 12 months warranty since the day of sale.

Serial number:

Dealer: date of sale:

12. Manufacturer

Production and service by:

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